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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,639	09/22/2003	Torleif Torgersen	60.1536 US NP	1108

37003 7590 06/26/2007

SCHLUMBERGER-DOLL RESEARCH
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EXAMINER	
GAKH, YELENA G	

ART UNIT	PAPER NUMBER
1743	

MAIL DATE	DELIVERY MODE
06/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,639	TORGERSEN ET AL.	
	Examiner	Art Unit	
	Yelena G. Gakh, Ph.D.	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *8,10-14,18,21-23 and 25-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9,15-17,20,24 and 34* is/are rejected.

7)☒ Claim(s) *2* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/20/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Election of species filed on 05/18/07 is acknowledged. Claims 1-34 are pending in the application. Claims 8, 10-14, 18, 21-23 and 25-33 are withdrawn from consideration. Claims 1-7, 9, 15-17, 20, 24 and 34 are considered on merits. In response to the Applicants' traverse of the restriction requirements of two groups directed to method and apparatus claims, the examiner would like to indicate that she did not read any additional limitations into independent claim 1. On the contrary, the examiner indicated that since claim 1 did not recite lifting the apparatus from the downhole, it means that the analysis is performed in-situ (although it is not claimed this way), while the apparatus does not require analysis in-situ and can be used for analysis on the ground.

Claim Objections

2. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 1 recites "moving a mixture of formation fluid and analytical reagent through a spectral analyzer cell", which means that the mixture of the formation fluid and reagent has been already formed in the method of claim 1, and therefore the subject matter of claim 2 does not further limit claim 1.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1 and 24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method comprising transferring the reagent from the reagent container into the flow-line, does not reasonably provide enablement for the method, which does not comprise such step. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention

commensurate in scope with these claims. If the reagent is not transferred from the container into the flow-line, there is no way to mix it with the formation fluid, which is the step of the method recited in claim 1. The subject matter of claim 2 should be recited in claim 1 in order to enable the claimed method.

Claims 2-7, 9, 15-17, 20 and 34 are not enabled the way they written, since according to claim 1 the reagent injection spectral analysis is performed after the mixture of formation fluid and analytical reagent is moved through the spectral analyzer cell in the fluid analyzer. Therefore, the step of injecting reagent into the formation fluid cannot be a part of performing the reagent injection spectral analysis, since the mixture should be formed before analysis. In order to examine these claims on merits the examiner interprets claim 2 as reciting injecting reagent into the formation fluid within the flow-line before the mixture is moved through the spectral analyzer cell. Also, the examiner interprets the expression "reagent injection spectral analysis" as "flow injection spectral analysis", since the analysis is performed not for the injected reagent, but rather for the mixture of the reagent and the formation fluid. The examiner suggests changing this expression to the one she provided, which is more conventional and technically correct. The claims need to be amended in order to overcome enablement rejections.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method comprising transferring the reagent from the reagent container first into the syringe body, does not reasonably provide enablement for the method, which does not comprise such step. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. There is no way for a person of ordinary skill in the art to inject the reagent using the syringe pump when the reagent is stored in the container. The reagent first needs to be transferred from the container to the syringe body before the reagent could be injected into the formation fluid using the syringe pump. Another option of making this claim enabled is to recite that the reagent container *is* the syringe body.

Claims 5-7 and dependent claims are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method comprising utilizing a controller for adjusting the volume of the reagent, does not reasonably provide enablement for the method, which does not utilize such controller. The specification does not enable any person skilled in

the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. In order to adjust the volume of the reagent injected into the formation fluid, with this step being performed downhole, there should be the automated controller, which controls such adjustment. The same is true for claims 15-17.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-7, 9, 15-17, 20, 24 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites as the first step "storing analytical reagent in a reagent container coupled to a fluids analyzer via a flow-line in a formation tester". From this recitation it is not clear, if it is only the flow line, or the reagent container, or the fluid analyzer, that is located in the formation tester, or all three elements are located in the formation tester. The examiner suggests the Applicants to specify which structural elements are located in the formation tester. The language of the claim renders it and all dependent claims unclear and indefinite, since it is possible to have the analyzer and the reagent located at the surface, and the flow-line located in the formation tester, which is transported downhole. In this case the method will be practiced in a different arrangement and have a different mode of operation, then the method utilizing the *in-situ* formation tester comprising the analyzer.

In the third step of the method of claim 1 the formation fluid is drawn into the flow-line. However, the flow-line is recited in the first step as only connecting the reagent container and the fluids analyzer; therefore, it is not clear, how the formation fluid can be drawn into such fluid-line closed from both ends. Further, it is unapparent, as to how a mixture of formation fluid and the analytical reagent can be formed to be moved through the spectral analyzer, if the reagent is stored in the reagent container and is not transferred into the flow line from there. Moreover, it is not apparent, what is the mixture of formation fluid and the analytical reagent. Since it is the analytical reagent that is recited in the claim, it may be assumed that it reacts with specific components of the formation fluid, and therefore the mixture is not exactly a mixture of the analytical reagent and the formation fluid, but rather the product of such reaction.

It is also not clear, what is meant by the expression "performing reagent injection spectral analysis". The expression assumes that the spectral analysis is performed on injected reagent, which does not correspond the claimed method. The examiner suggests changing the expression to "performing flow injection spectral analysis".

In claim 3 it is not clear, how the syringe pump is related to other structural elements of the formation tester. Since the structure of the formation tester defines performing of the claimed method, the structural relation between the syringe pump and the elements of the apparatus recited in claim 1 is essential for practicing the method. It is further unclear, as to how the reagent is injected by the syringe pump, if it is stored in the reagent container. In order for the reagent to be injected into the formation fluid by the syringe pump, it first needs to be extracted from the reagent container, or the reagent container should be a syringe body.

From claim 4 it is not quite clear, how the recited step of "establishing and storing baseline optical density values for at least one wavelength" is related to the method recited in the preceding claims. First, the spectral analyzer is not defined as an optical spectral analyzer in the parent claims. Spectral analyzer can be NMR or MS analyzer, which are not optical analyzers, and then it is not clear, why the step recited in claim 4 should be performed. Moreover, if optical analysis is performed for the mixture (or the product of reaction) of the analytical reagent and the formation fluid, they should be optically active. Also, it is not apparent, which "baseline optical density values for at least one wavelength" should be established and stored (where?). Are these values for a specific optical spectrum of a specific compound? The recitation of the claim is unclear.

From claim 5 it is not clear, if the predetermined volume of reagent is injected into an undefined volume of the formation fluid, and therefore the concentration of the reagent in the resultant mixture is undefined.

In claim 6 it is not clear, what does it mean, "adjusting the predetermined volume"? If the volume is predetermined, why and to which value should it be adjusted? The recitation is not quite clear.

In claim 7 adjusting the volume by adjusting the time of injection is possible only when the flow rate of injection is known; the flow of injection is not recited in the claim, which makes

it unclear, as to how the volume can be adjusted by adjusting the period of time for injection, if the flow rate of injection is not known.

Claim 15 is not clear. How can injecting reagent include extracting formation fluid from a stopped flow-line? The examiner does not quite understand what is meant by this expression. How is injecting the reagent related to extracting formation fluid, and where is the formation fluid transferred to after it is extracted from the stopped flow-line? It is also not clear, what is the "stopped flow-line" and how is it related to the fluid line of claim 1? Claim 15 needs to be clarified.

All issues related to the volume of the reagent are the same as were indicated above (claims 16-17).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 1-2, 4, 24 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grey et al. (US 5,246,862) in view of Clark et al. (US 6,564,866).

Grey discloses "method and apparatus for in-situ detection and determination of soil contaminants" (Title): "A reagent carrying tape is captured between the soil and the outer wall of penetrometer. As the penetrometer moves with respect to the soil, the tape is pressed against an optical window in the penetrometer. Contaminants in the soil reacting with the reagents cause an

optically sensible reaction in the tape to occur which is optically detected at the optical port as the penetrometer moves with respect to the tape and the soil sample. The optically sensible reaction occurring in the tape is optically isolated from the masking effects of the soil. A method is also disclosed" (Abstract).

Grey's method is directed toward detection of contaminations in soil using the reagent-impregnated tape and therefore does not disclose mixing of the reagent with the formation fluid and moving the mixture through the flow cell of the analyzer.

Clark discloses a method and apparatus for detecting the presence of a fluorescence tracer dye (the analytical reagent) in the formation fluid by mixing the fluorescence tracer into the formation fluid and moving the mixture through the flow cell of the spectral analyzer: "a downhole tracer detection sensor module is provided for a quicker response time as the tracer detection sensor is installed closer to the source, i.e., tracers module and provides almost instantaneous and direct analysis" (col. 3, lines 14-18); "a fiber optic fluorometer/spectrometer instrument is also provided to determine the concentration and distribution of dye tracers within the harsh conditions of the hydrocarbon process flow stream" (col. 3, lines 29-32).

It would have been obvious for any person of ordinary skill in the art to modify Grey's method for determining components of formation fluids, rather than the soil, by mixing the reagent with the formation fluids and analyzing the mixture in the flow cell of spectrometer/ photometer, as disclosed by Clark, because this allows expending Grey's method for important analysis of formation fluids. It would have been obvious for any person of ordinary skill in the art to have reagents stored in the reagent containers rather than impregnated in the tape, because it allows better regulation of the amount of reagents mixed with the formation fluid.

10. **Claims 3 and 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grey in view of Clark, as applied to claims 1-3, 24 and 34, and further in view of Tawarayama et al. (US 5,783,740).

Grey in view of Clark do not specifically disclose flow injection analysis of the mixture of the reagent and the formation fluid using the syringe pump with a predetermined volume of the reagent.

Tawarayama teaches a method for detecting trace elements in water flow using flow injection of coloring agents into the flow loop with a syringe and flowing the mixture of through

the flow cell of the spectrophotometer. "The syringe pump, which is different from a plunger pump or peristaltic pump for continuously feeding a solution, is able to inject a specified amount of a carrier solution or a coloring reagent into a flow passage. Accordingly, when the sample is introduced into the second loop, the valve is switched in direction to the second flow passage side, so that the sample and the coloring reagent sampled by the syringe pumps are injected into the second flow passage and mixed to each other, thus to perform the coloring operation. Since the syringe pump can be operated as required by controlling operation of the syringe pump, switching of the valve, and the like in term of time, the consumption of the coloring reagent is minimized, and also the control thereof is made easy. The detection unit in (4) has a flow cell into which a substance (reacted substance) colored in the second flow passage is injected using the syringe pump, followed by measurement of absorbance at a specified wavelength" (col. 3, lines 53-67 and col. 4, lines 1-7).

It would have been obvious for a person of ordinary skill in the art to improve Grey-Clark's method by providing flow injection system using syringe pump as disclosed by Tawarayama, because it allows a controllable injection of reagents into the formation fluid and minimizing the consumption of the reagent.

11. **Claims 9, 15-17 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grey in view of Clark and Tawarayama, as applied to claims 3 and 5-7 above, and further in view of Tubel et al. (US 5,597,042).

Grey in view of Clark and Tawarayama do not specifically disclose injecting reagent into the stopped formation fluid.

Tubel teaches a "method for controlling production wells having permanent downhole formation evaluation sensors" (Title), including chemical sensors (see col. 18, lines 19-20). Tubel indicates, "the processor 50 simply evaluates parameters existing in real time in the borehole as sensed by flow sensors 56 and/or formation evaluations sensors 58 and then automatically executes instructions for appropriate control. Note that while such automatic initiation is an important feature of this invention, in certain situations, an operator from the surface may also send control instructions downwardly from the surface to the transceiver system 52 and into the processor 50 for executing control of downhole tools and other electronic equipment. As a result of this control, the control system 50 *may initiate or stop the fluid/gas*

flow from the geological formation into the borehole or from the borehole to the surface" (col. 14, lines 52-64).

It would have been obvious for any person of ordinary skill in the art to use the control system in order to stop the flow of the formation fluid, as taught by Tubel, in Grey-Clark-Tawarayama's method, because injecting the certain amount of the reagent into the stopped formation fluid allows to more precisely estimate its concentration in the mixture, which affects results of the analysis.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. *Weirich et al. (US 6,176,323)* discloses "drilling systems with sensors for determining properties of drilling fluid downhole" (Title); *Tubel et al. (US 6,588,266)* teach "monitoring of downhoile parameters and tools utilizing fiber optics" (Title).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YELENA GAKH
PRIMARY EXAMINER

6/18/0799